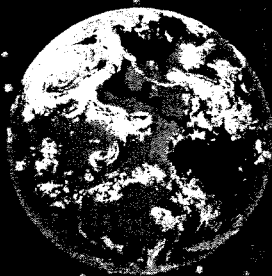


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# THE ECOLOGICAL IMPLICATIONS OF ANCESTRAL RELIGION AND RECIPROCAL EXCHANGE IN A SACRED FOREST IN KARENDI (SUMBA, INDONESIA)

Cynthia T. Fowler

## *Abstract*

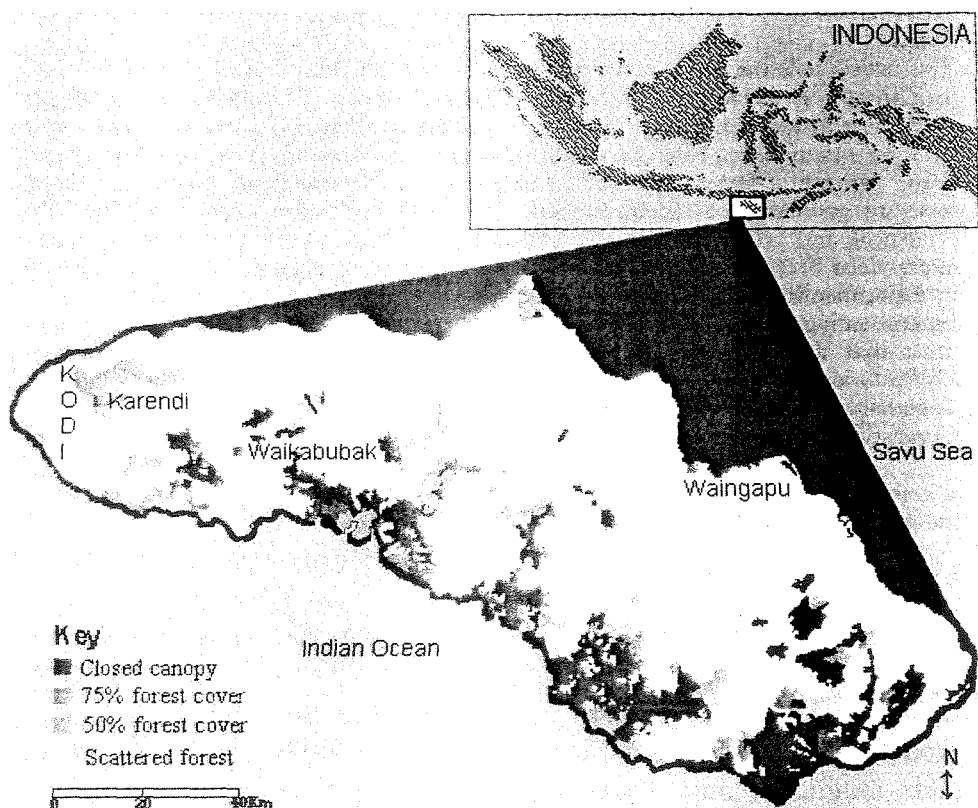
This article tells the story of the sacred place named Mata Loko ("River's Source") in Karendi on the western end of the island of Sumba. This ethnographic case of an eastern Indonesian society where the traditional religion of *Marapu* persists sheds light on questions of how local belief systems are part of environmental adaptations. The use of sacred resources is restricted by the belief that *marapu*, the ancestors, are guardians of the forest and is enforced by supernatural sanctions. The ecological and religious processes that are described in this article illustrate that interactions between indigenous and world religions impact local cultural ecologies. In experimenting with their indigenous religion, Karendi people are simultaneously experimenting with traditional resource management. The Mata Loko case illustrates that the ritual management of scarce resources such as water and culturally/historically valuable resources such as bamboo is a form of conservation planning. Together cultural history, reciprocal exchange, and ancestral religion provide a framework for protecting valuable natural resources.

*Keywords:* Sumba, local ecology, resource management, reciprocal exchange, ancestral religion

## *Introduction: Indigenous religion and environmental management*

The term "Karendi" refers to a complex collection of social and ecological entities. Karendi is the name of an indigenous social group, their language, and their homelands. The domain of Karendi is located within the administrative village of Waiholo in the district of Kodi, West Sumba. Waiholo encompasses the twelve hamlets of Karendi and approximately fifty other hamlets. It is located approximately 15 km inland from the coast of the Indian Ocean in the Balaghar region of Kodi. The Karendi landscape is a mosaic of forested hills and valleys interspersed with hamlets, gardens, orchards, grasslands, and water sources. Karendi is the most interior region in the village of Waiholo. In 1997 the population of Waiholo was 3,133 people.

In Karendi, religion often mediates ecological strategies. The relationship between religion and ecology on Sumba is complex because



Map 1: The Island of Sumba. Adapted from Rudyanto. 1996. Sumba.  
[Http://users.bart.nl/~edcolijn/sumbamap.html](http://users.bart.nl/~edcolijn/sumbamap.html).

there are multiple, overlapping religions and environmental paradigms. In Karendi, *Marapu* (the name of the indigenous religion and a word that literally translates as "Ancestors"), Protestantism, Catholicism, and Jehovah's Witness form dynamic syncretisms that greatly impact the ways that people interact with their environment. This article examines the ecological implications of religious experimentation with a particular focus on changing conceptualisations and manipulations of elements of nature that are *sacred*. Sacred resources are distinguishable from mundane, non-sacred ecological goods and services by the complex set of meanings and regulations surrounding them. Cultural history and reciprocal exchange lend value to sacred resources in Karendi. In the discussion that follows, I describe the ways that Karendi people talk about and handle sacred resources in relation to the goals of conservation biology.

The main source of data for this article is the behaviour of Karendi people in their interactions with natural resources, their descriptions and explanations of this behaviour, and my inferences from the basic data. I gathered this data during 1997 and 1998 when I resided in the village of Waiholo. In addition to describing the beliefs and behaviors of Karendi people, I also draw upon relevant data from other hamlets in Waiholo and in several surrounding Kodi villages including Bukambero, Kori, and Manganipi. The cross-referencing to other parts of Kodi and other aspects of culture allows me to situate the machinations of the sacred within larger social and ecological contexts.

#### *A sacred forest*

Mata Loko is the most sacred place in the Karendi community. It is one of the many sacred places in Kodi whose story is used by Karendi people to justify their right to live where they do, to cultivate their fields, and to harvest products from their forest. This discussion of Mata Loko is constructed from the paths that Karendi people guided me down and the stories they narrated to illustrate the magnitude of the ancestors' power. At the centre of this story are aspects of Mata Loko that Karendi people highlight as being religiously significant. My version of Mata Loko's story demonstrates that Marapu contains sentiments that encourage conservationist ethics. In a community where the majority of the people adhere to an

indigenous religion, some especially significant natural resources are protected from harm. Mata Loko's story illustrates that in some cases traditional religion supports the goals of conservation biology.

This case study does not prove in quantitative terms that religious institutions in Kodi have the effect of biodiversity conservation. Instead, it is a presentation of qualitative data to describe the meaning and implications of the notion of "sacred" in Kodi as it relates to natural resources. I do not claim that Kodi people are indigenous conservationists; that is not the argument that I am making. Rather, the basic question that I address is: What rules govern behavior towards sacred resources? I do not attempt to answer the questions: To what degree do Karendi follow the rules? Or, How does the designation "sacred" affect the biological and ecological characteristics of particular resources? These are valuable questions that I would like answer by conducting further research. But, this article does not attempt to argue that "sacred" natural resources are preserved to a greater degree than non-sacred ones.

It is clear from the information presented below that Marapu, the traditional religion of Kodi, contains conservation ethics and that these ethics relate to cultural history and socioeconomic institutions. After introducing the reader to Mata Loko, I discuss the significance of cultural history in relation to the value of sacred objects and processes. Following the section on history, I describe the significance of reciprocal exchange in relation to social and ecological relationships. The purpose of these discussions is to demonstrate that together cultural history, reciprocal exchange, and ancestral religion provide a framework for protecting valuable natural resources.

### *The fusion of Marapu and Christianity*

In Kodi, innovative beliefs and practices have emerged from the fusion of world religions and Marapu. In the early 1980s, 80% of the population of Kodi was still registered as a member of Marapu, the indigenous ancestral religion (Hoskins 1993). Kodi people face a variety of social, cultural, political, and economic pressures to convert to a world religion. Most have chosen to convert either to Protestantism or Catholicism. Many of those who have converted to Protestantism or Catholicism have publicly disavowed customary laws regulating sacred resources. They claim that they no longer believe

in the ancestors who inhabit the forests and govern sacred resources. People who have converted learn that the Kodi ancestors are not only irrelevant but malevolent. They learn to refer to the ancestors as "Devils" (*Setan*) rather than by the traditional titles "Dead People" (*Toyo Mati*) and "Ancestors" (*Marapu*). They learn that the ancestors cannot enforce customary law, so the converts need no longer adhere, for example, to customary taboos that regulate natural resource management. Christian converts declare that they are exempt from traditional religious and behavioural regulations which include seasonal prohibitions on harvesting trees, digging tubers, hunting wild game, and collecting medicines from sacred forests.

Tensions and contradictions between Christianity and Marapu lead both to defiance of and anxiety about customary environmental codes. In the context of the transitions to Christianity—or back and forth between Marapu and Christianity—the violation of indigenous policies is materially significant. A new set of environmental rules may be forming in which the same incentives to follow the rules—the threat of natural disasters brought forth by the ancestors—are no longer effective because Christianity teaches that God, not the ancestors, controls the local ecology.

In the daily lives of Kodi people—whether or not they have declared their conversion to a world religion—Christianity and Marapu overlap. For example, many people who proclaim themselves to be Catholic still participate in Marapu rituals and still openly honour their ancestors. Several men in Waiholo are simultaneously leaders in their Protestant or Catholic house of worship as well as officiants of Marapu rituals. Protestant-Marapu and Catholic-Marapu syncretisms in Kodi are consequential to contemporary interpretations of the idea of "sacred" and its implications for environmental management.

### *The ancestors and the sacred*

While I was conducting ethnographic research on cultural ecology, Kodi people constantly reminded me that the ancestors participate in natural resource management. This belief in the role of the ancestors influences the ways that Kodi manage their gardens, orchards, grasslands, and forests. The ancestors influence ecological processes including interactions between people, fauna, and flora. They also

govern hydrological processes involving rainfall, freshwater springs, rivers, and oceans. Marapu elders continually warn their congregations that if the ancestors are unhappy, natural disasters will occur, resources will be scarce, people will suffer famine, disease, and death. The presence of such misfortunes signifies that the ancestors are angry. Further misfortune will follow unless people can appease the ancestors with the proper ritual payments. Marapu followers perform rituals to please the ancestors, to ask for favours, to prevent them from becoming angry, or to quieten their anger. A variety of resource management activities are associated with ritual activities. But, all resources are not equal; rituals are more or less elaborate, more or less necessary depending on the particular resource. In Kodi, the resources that are most closely associated with ritual performances are those resources that are considered to be "sacred."

The men, women and children of Kodi who taught me what "sacred" means in their society and environment have inherited many sacred resources from their ancestors. Kodi people took every opportunity to tell me about the sacred artefacts in their attics, the sacred places in their homelands, and the sacred plants in their forests that evidenced the glory of their forbears. They generously allowed me to sleep in their homes, eat from the gardens, and work in their fields. They stressed their desire that I also respect their ancestors. They emphasised that they have inherited ownership rights to their homes, fields, and forests. They demonstrated proof of ownership by showing me the places where their ancestors, who originally staked claim to the territory, lived, fought, farmed, and travelled. In their view, the sacred places, sacred objects, and sacred plants that mark the exploits of the ancestors are indisputable proof of their rights to own the land and its products. Sacred landmarks in the Kodi landscape signify a link between the living generation and the ancestors.

### *The historical value of the sacred*

#### *Sacred value*

Sacred processes and objects are often specified with the Kodi term *hari* that is translated into Bahasa Indonesia, the national language, in two ways: 1) with the Indonesian term *pemali* meaning sacred, taboo or ritually prohibited and/or 2) with the Indonesian term *keramat* meaning sacred or holy. Two related Kodi terms that apply



to sanctified goods and services are *weri* (taboo) and *bihya* (sacred). Many of the objects and processes that are sacred have been inherited and are associated with events in the life histories of the ancestors. Karendi people believe that their ancestors protect sacred resources from misuse.

One of the most prominent characteristics of natural resources that are sacred relates to the role of the ancestors in the environment. Ancestors have the power to control environmental processes such as rainfall patterns and crop yields. But they are particularly interested in those natural resources that are sacred. The ancestors monitor and direct the ways that Kodi people use sacred resources. They place limits on wildlife harvests by, for instance, restricting pig hunting season. They demand payment for crop harvests by, for instance, requiring ritual sacrifices before cutting rice. To maintain the ancestors' favour, people regulate their use of some resources; for example they avoid killing the pythons that are sacred because they are the clan totem for many people in Karendi. Throughout Kodi, people often craft their behaviour to address the desires and demands of the ancestors. This includes environmental management but is especially relevant to their use of natural resources that are sacred.

#### *Time and Value*

Hoskins (1993) argues that time is the basis of value for ancestral objects that are such an important part of ritual life in Kodi. She found that in Kodi ancestral items often have a temporal value relating to an individual's biography measured by the quantity of time invested in producing the items. The individual whose life history is used for measuring value may be one who is currently living or one who is already dead and thus an "ancestor." An item that was produced by or owned by an ancestor frequently has greater value than a novel item purchased in a store because it represents longer spans of time.

The value of an exceptionally treasured item is constituted by its own origin, age, and history. For example, the value of a water buffalo or a pig is measured by the length of its horns or tusks which indicates the animal's age and represents the investment of a great deal of time and energy by the livestock owner. The exchange value of a head of livestock is equivalent to the sum of the length of its horns, in the case of a water buffalo, or tusks, in the case of pigs.

Livestock is the standard currency in exchanges among people in marriage and funeral rites. Livestock is also currency in healing ceremonies and agricultural rites where one or more are sacrificed and offered to the spirits as payment for a favour. Other items that are commonly used in ritual exchange are horses, dogs, chickens, knives, cloth, gold, household utensils, and occasionally cash. The value of these exchange goods relate to time conceptualized as the biography of living individuals or of a single generation.

Temporal value is indicated, not only by an individual life history or a single generation, but also across multiple generations. Multi-generational time is embodied in the sacred objects, places, and processes that are associated with the ancestors. Items that are attached to the activities of the ancestors represent greater investments of time (multiple generations rather than a single life span) and therefore greater value. These include heirloom objects that are stored in the lofts of houses in ancestral villages such as gold ornaments, ceramic pots, and weapons. They symbolise the lives and relationships of the people who once owned them. The most sacred manmade objects are stored in attics and only brought down for ceremonial purposes (Hoskins 1993; Keane 1997). Natural resources that are sacred, such as particular specimens of living lianas, are sheltered *in situ* and are used for ceremonial purposes. "Old" items, which are often ritually exchanged, embody current and historical social relationships.

As previously mentioned, certain aspects of the physical landscape embody local history. Scattered throughout the Kodi landscape are memorials to legendary figures, events, and places. Histories of migrations, land allocations, battles, and other significant events are bound to particular locations. Ancestral spirits and ghosts are still present in the locations of historical events. The places where the ancestors reside—including particular forest patches, hills, water holes, caves, trees, and rocks—are natural shrines. Thus, whereas multi-generational time constitutes value in "old" exchange items, it also connotes value in nature.

#### *A history of Karendi*

Throughout Sumba local people recount great migration epics (Onvlee 1977) describing the movements and activities of their ancestors. Karendi oral histories are grounded in the landscape. They memorialize

particular places where significant events occurred and that represent the "footprints" of their ancestors. Oral histories record the movements and exploits of these founding ancestors. The locations that are named in migration tales are very often sacred places for the people who live in Karendi today. Often, sacred places are sites of significant historical events recalling marriage relations, land transfers, battles, deaths, as well as encounters between people, animals, plants, and spirits. Sacred places are locations in the landscape that symbolise the historical depth of the presence of Karendi people within Kodi, legitimising their claims to property rights and political power which, throughout Indonesia, are contentious issues.

The ancestors of the people who live in Karendi today migrated to the region many generations ago from domains to the east and north of Kodi and began inter-marrying with the "Fish People" who already inhabited the area as well as with other clans living in Kodi. Many of the current inhabitants of Karendi and the hamlets that border it came from other parts of Kodi and the neighboring domains of Bukambero, Wejewa, and Laratama to marry the daughters of Karendi. Men who marry into Karendi families are usually allotted property by the landowners of Karendi where they can cultivate gardens and build houses. The transfer of property from a man to his son-in-law involves a ritual feast in which the son-in-law's family presents a dog and a machete to his wife's family. In return the father-in-law plants an Indian silk cotton tree (*Ceiba pentandra*) or a hau tree (*Hibiscus tiliaceus*) which functions as the land deed. The "promise" of land is "tied" by placing a stone upright at the base of the tree. The Indian silk cotton or hau tree that is planted in land transfers is called Lord of the Land (*Mori Cana*). The stone at the tree's base symbolises the ancestors (thereby giving it supernatural authority) and becomes the sacrificial altar for all important hamlet rituals. The Lord of the Land is a sacred tree and the area immediately around it is a religious shrine.

### *The forests of Karendi*

Forests and forest products are critically important in the Sumbanese economy. The most important forest products on Sumba include various types of timber trees especially teak (*Tectona grandis*) and mahogany (*Swietenia mahogani*); candlenut (*Aleurites molluccana*); tamarind

(*Tamarindus indica*); forest betel (*Piper betle*); cinnamon (*Cinnamomum zeylanicum*); rattan (*Calamus* spp.); turmeric (*Curcuma domestica*); sugar palm (*Arenga pinnata*); and walet birds (*Collocalia* sp.). Some portion of the non-timber forest products is consumed on Sumba while another portion is exported. In Karendi, people harvest many products for household subsistence plus they sell a diverse array of forest products in local markets.

There are several major forest types in West Sumba including evergreen monsoon vine forests, semi-evergreen vine forests, evergreen forests, thorn scrub forests, and mangrove forests (Banilodu and Saka 1993). According to 1997 records from the Indonesian Ministry of Forestry, West Sumbanese forests include Limited Production Forest (32,331.41 ha), Continuous Production Forest (16,847.27 ha), and Protected Forest (39,563.32 ha). 1992 LANDSAT images of the whole island of Sumba show that 16% of the land is forested (11% closed canopy) and 78% is unforested. Of the unforested area, the LANDSAT images show that 13% is cultivated land and 67% is grassland.

Using the national language Bahasa Indonesia, Kodi people place forests into two major categories: *hutan* and *belukar*. *Belukar* corresponds to the Kodi term *kalimbo kandagu* meaning a small, secondary forest patch where there are not many trees or big plants. *Hutan* corresponds to the Kodi term *kandagu bokolo* meaning an expansive forest containing many large trees. Some specific patches of forests within these two categories are marked as sacred forests (*kandagu hari*). There are sets of beliefs about the nature of sacred forests and accompanying behavioural codes. Some basic prohibitions for people while they are in sacred forests—and sacred places in general—are talking loudly, eliminating waste, loitering, and uttering its ritual name or discussing its history in a non-ritual context. People avoid entering forests alone or at night due to the fear that forest spirits will cause physical or psychological harm; particularly sacred forests where spirits are especially abundant.

#### *Land tenure in Sumbanese forests*

There is a complex system of land tenure in Karendi forests and the surrounding fields and villages. Private and communal ownership co-occur within the local community. Concurrently, local ownership intersects with ownership by the federal government. While

a portion of Karendi land is locally owned, another portion is owned by the Indonesian national government. Land tenure in Karendi is not only overlapping and complex, it is also contested.

Since the Indonesian government was founded in 1950, it has been expropriating many of the traditionally owned forests and grasslands in Kodi. The government labels much of the expropriated territory as "Protected Forests," a category that disallows many indigenous resource management practices including swidden cultivation and the inheritance of ownership rights. However, the national land tenure system does grant temporary usufruct rights for land where the forest canopy is not yet closed.

Many households in Karendi have at least two or three gardens where they grow a wide of variety of plants including corn, rice, millet, taro, yams, squash, beans, peppers, and papaya. A 1997-98 survey of 50 Karendi households revealed that 34 households cultivated gardens on government land. A tabulation of tenure in the gardens cultivated by residents of these 50 households shows that 19% of gardens were on federal land, 64% on family-owned land, and 5% on land borrowed from other local people. In exchange for temporary usufruct rights, these households are required to plant cash crops such as candlenut (*Aleurites moluccana*), cashew (*Anacardium occidentale*), coffee (*Coffea canephora* var. *robusta*), jackfruit (*Artocarpus integrifolia*), mahogany (*Sweitenia mahoganii*), and teak (*Tectona grandis*). The cultivators are allowed to utilize any of the trees' products for green manure, forage, food, or for sale in the market except for the timber.

#### *Sacred resources in Mata Loko*

Within Mata Loko there are clusters and types of sacred resources whose use is regulated by customary law. In addition to being the name of a geographical area within Karendi, Mata Loko is the name of a cave, the river that flows out of the cave, and the lowland forests and grasslands flanking the riverbanks within that area. Several of these components of the Mata Loko are sacred to Karendi. Mata Loko Forest is a sacred riverine forest ecosystem surrounding the headwaters of the Mata Loko River. The Mata Loko River, which descends southwest out of the wetter hills of Karendi down onto the dryer coastal plains of Kodi, is sacred. Another sacred component is Mata Loko Cave where, as the local people say, "the water

emerges," or where the river surfaces from the karstic subsurface. The Rat Stone, at the entrance to Mata Loko Cave, consists of several rocks piled up to form an altar and is the epicentre of the sacred site of Mata Loko. The Rat Stone represents the original ancestor of Mbuku Mangi, a powerful clan in Karendi whose totem is the rat. Mata Loko Cave is "a gathering place for all spirits" including the malevolent ones who have "poisonous breath." Mata Loko Forest, surrounding the cave and covering the riverbanks is sacred as well. In addition, several freshwater springs, types of plants, and plant clusters within Mata Loko Forest are sacred.

Generations of Karendi people have lived and worked on the land where Mata Loko is located. The spirits and ghosts of past generations still use Mata Loko as a gathering place and a ritual site. Karendi people say that the "Ancestors" (*Marapu*), or "Dead People" (*Toyo Mati*), still inhabit this world. One of the duties of the ancestors is to enforce customary laws governing sacred places like Mata Loko and sacred stories like the histories of Karendi. They move around the landscape monitoring the activities of their descendants in both sacred and non-sacred places. The ancestors especially like to be in sacred places. In other words, sacred places are those areas where populations of ancestors are especially dense. The ancestors monitor human activities in sacred places where they enforce behavioural codes governing interactions with sensitive resources and special spots. The sanctity of Mata Loko is not unique in Kodi since numerous places throughout the district are sacred. The ways that Karendi people manage Mata Loko is comparable to the ways that local people manage other sacred forests in Kodi.

Stories about Mata Loko are cultural histories that record the escapades, movements, and lives of previous generations. The stories about Mata Loko are themselves sacred and can only be recited in ritual settings by Marapu elders who "own" the legends. Oral histories of the migratory journey to Karendi provide clan genealogies, locations of ancient villages, descriptions of the land, and the poetic names of sacred sites. Oral histories are composed of long strands of couplets and their narration is formalised. These ritual stories are narrated at night by a *Rato Marapu* ("Marapu Elder" or "Marapu Priest") and are accompanied by sacrificial rituals during which a chicken, betel vine leaves, areca nut, rice, and various other sacraments are offered to the ancestors. These sacrificial offerings are known as *wulla mata*, literally translated as "eyebrows" or "eyelashes".

An effect of presenting *wulla mata* is that the ancestors come to the location of the ceremony to monitor the honesty of the narrator and to channel the tale through the narrator. In the case of ritual recitations, *wulla mata* serve as payment for the privilege of recounting cultural histories and the continuing patronage of the ancestors.

The management of natural resources within Mata Loko is guided by a set of prohibitions that apply to all sacred sites in Kodi plus a set of proscriptions that apply specifically to Mata Loko. Many of the taboos that regulate the use of natural resources in Mata Loko are related to Karendi cultural history. Certain plants that are subjects of taboo are mentioned in Karendi oral history as natural resources that were included in the land granted to the first settlers of Karendi. For example, the first settlers were given bamboo that they planted on the riverbank just outside of Mata Loko cave. There is now a taboo on harvesting from this particular sacred cluster of bamboo. There are also prohibitions in Mata Loko Forest against cutting stalks from particular clusters of rattan, digging from certain patches of wild yams, and collecting mud to use in manufacturing ceramics from certain wet areas. These resources are sacred because they were part of the original contract in which the "Fish People" granted land to *Umbu Bobo* (Grandfather Python) the first Karendi settler. Another taboo that applies specifically to Mata Loko is a prohibition against any member of the Mbuku Mangi clan who has ever eaten rat to enter Mata Loko Cave. The regulations governing use of sacred resources within Mata Loko are only a subset of a broader resource management regime in Karendi. Other rules and customs apply to the management of places and resources that are not sacred.

*The role of reciprocal exchange in social relations and natural resource management*

*Reciprocity, Sacred Resources, and Environmental Management*

On Sumba, reciprocity is a social institution that structures political, economic, and cultural relationships. In an analysis of value in the Sumbanese district of Anakalang, Keane (1997) suggests that reciprocal exchange is responsible for transforming mundane objects such as metal coins, cloth and pigs into ritually significant items. I tend,

rather, to agree with the order of causality provided by Keane's Anakalangesse informants: the conceptual conversion of an object's status is prior to its use in reciprocal exchange. There is a major difference between Keane's research and mine that might account for our different views on the flow of causality between mundane and sacred: Keane's research revolves around manufactured and domestic commodities and my research focuses on natural resources. Moreover, I focus on the exchange of sacred natural resources between the living community and the ancestors while Keane's research includes the trade of both sacred and non-sacred objects among patrilineal groups in the living population.

In Kodi and in Karendi, the exchange of agricultural products and prestige objects is central to geographically extensive socio-economic connections within and between social domains. An implication of reciprocal exchanges in Kodi is that the present generation reifies their obligations as caretakers of the natural resources left to them by their forbears. Reciprocal exchanges link Karendi people to their ancestors and to sacred parts of their landscape. In relation to sacred natural resources, reciprocity in Karendi serves as a type of social and environmental management.

#### *Ritual exchange and harvest regulations*

The rules of Marapu state that, prior to entering a sacred place or harvesting a sacred resource, a ritual must be performed. For example, in order to harvest trees within the sacred place of Mata Loko, a person must sponsor a ritual. During this ritual, a *Rato Marapu* offers prayers and presents sacrificial animals to the ancestors who govern the sacred place. The *Rato Marapu* uses the sacrificial animal's internal organs for divination to determine whether or not the ancestors concur with the community's harvest plans. If the ritual performance is successful, the ancestors who inhabit Mata Loko provide counter gifts in the form of temporary injunctions on the prohibitions governing the use of sacred resources.

According to customary codes, if someone harvests resources from a sacred place without first obtaining permission from the ancestors, then they must sponsor a supplicatory ritual. During the supplicatory ritual, the offender must hire a *Rato Marapu* to perform a ritual during which he presents the ancestors with prayers and animal



sacrifices and begs them to forgive the offender's infractions. If sacrificial rituals are not performed prior to or following the use of sacred resources, then the ancestors will cause natural disasters or will cause the offender, his family, and/or his entire community to become sick. This system of ritual exchange is not employed in relation to non-sacred places or the exploitation of non-sacred products within Mata Loko.

*Penalties for mis-management*

In the Marapu faith, the ancestors punish people for committing sins such as failing to fulfil reciprocal obligations, stealing, adultery, violating taboos, breaking promises, presenting inadequate sacrifices, or failing to perform scheduled rituals. When a family in the hamlet of Bondo Ngiyo, Bukambero (another region in Kodi) converted to Christianity, one of the ways they proclaimed their adoption of Christianity was by cutting down the Lord of the Land in the centre of their hamlet—a symbol of their old faith. Following the destruction of this sacred site, a series of tragedies, including serious illness, death, and crop failure plagued the family. The family consulted a *Rato Marapu* who, through divination, determined that the ancestors would forgive the transgression of the family who cut down the Lord of the Land if they performed an expensive, multi-day sacrificial healing ceremony (*yaigho*). (See Hoskins 1988 for details about *yaigho*.) To atone for their sins, the family staged the healing ceremony, begged forgiveness for their infractions, and planted a new tree to restore the Lord of the Land. The ancestors, however, were not appeased and the family continued to be plagued by misfortune indicating that further payments had to be offered to the ancestors. So the family staged two more *yaigho* during which they sacrificed several more chickens and pigs. In this case, the penalty for defacing a shrine of the native Marapu religion was expensive. The mutual respect that usually exists between the ancestors, in this case represented by the Lord of the Land, and their living descendants was damaged. This resulted in a sort of negative reciprocity in which the ancestors punished the family for mistreating the Lord of the Land.

This story of the maltreatment of Bondo Ngiyo's Lord of the Land highlights several interesting points about contemporary Kodi life. One point is that religious conversion is not irreversible since people

can interpret unfavourable events as proof that the ancestors are still active and the indigenous religion is still valid. Perhaps the more relevant point that the above scenario illustrates is that there is a link between values and behaviours relating to sacred places. The destruction of the Lord of the Land was perceived negatively by some members of the Bukambero community because they interpreted misfortunate events experienced by the family in Bondo Ngiyo as indicative of the ancestors' anger. The belief that the ancestors disapproved led to the resurrection of the Lord of the Land and the restoration of the sacred tree. Since the Lord of the Land is a tree, this scenario illustrates that the unjustified destruction of natural resources that are sacred is negatively valued in Kodi culture. The Lord of the Land is actually much more than a biophysical entity, though; it is a symbol of the strength, vitality, and heritage of Kodi society.

*Reciprocity in human relationships and human-environment relationships*

*Exchanging for rain*

The Sumbanese perceive and manage critical natural resources in ways that are comparable to other highly respected assets; such as women (Onvlee 1977), rice, and water. The following description of a rainmaking ceremony in Karendi provides a means for illustrating the dynamics of the reciprocal exchange of ecological products. Mata Loko is said to be "the source of rain" for all of Kodi and the neighboring district of Weyewa. In fact, the rainy season begins earlier in Kodi because of the directions of the monsoon winds. In addition to being the wettest<sup>1</sup> part of Kodi, Karendi also has the most forest cover and the highest elevation in the district.

Rain making rituals are performed in years when the monsoons arrive late and the dry season (*wulla maratana*) is long. The "rights to rain" are controlled by one or a few *Rato Marapu* who have inherited the privilege from their forefathers. Doka Tora is the man who currently possesses the rights to the rains that fall in the sacred site of Mata Loko. The following passage is a quote from Doka Tora in which he describes the rain shaking rituals that he performs:

On the night of the rain shaking ritual I go into Mata Loko Forest with two or three other elders. We listen while the forest spirits play

music with their drums and gongs, sing, talk, and laugh. People can hear the spirits and see their hearths burning, but the spirits themselves are invisible. My companions and I remain silent so that we do not disturb the spirits. We sacrifice a chicken, and sprinkle its blood on the Rat Stone. Then we roast the chicken over a fire so that it will rain. Meanwhile, we chant couplets invoking our ancestors and requesting that the ancestors provide rain to irrigate the crops and fill the bathing places with water.

Rain shaking ceremonies represent the commitment of Kodi people to their relationships with the ancestors. Recall, inter-generational ties are bound by reciprocal exchanges in which a gift of a sacrifice must be given in order to receive a counter gift of a sacred natural resource. The ancestors prefer the sacrifice of a chicken as partial payment for their service in rain shaking rituals; but they have preferences for other animals in other types of rituals. In the rain shaking ceremonies, the ancestors reciprocate the prayers and sacrifices from the human world with a counter payment of rain. The ancestors answer prayers and sacrifices offered in planting rites performed at the beginning of the Bitter Season in October, November, or December through delayed reciprocity. The counter payment for the offerings of the planting rites is the rice that is reaped from December through May. The purpose of these rituals is to ensure that the ancestors look favourably upon the living generation. As long as the ancestors and the living generation are allies, Kodi people will benefit from ecological goods and services.

In rain shaking rituals the natural, human, and supernatural realms together engage in reciprocal relationships. Rain would not fall, crops would not grow, and people would starve if the social bonds were not maintained via reciprocity. Reciprocal exchanges are the basis of social relationships. Likewise, reciprocity is the basis of relationships between Kodi people and their ancestors, between the earthly and spiritual worlds. In Karendi, as in other indigenous communities in Southeast Asia, the management techniques of current inhabitants of the land are shaped by the belief that they are responsible for taking care of inherited goods and items that were valuable to their ancestors (Colchester 1993).

#### *Social relations and water management*

The connections between society, ecology, and reciprocity are depicted in the traditional dynamics of dam building in the East Sumba

domain of Mangili (Onvlee 1977). In Mangili the symbolism of dam building is analogous to marriage transactions. In both situations, the wedding of a male and a female entity is an affair that establishes and/or strengthens alliances between extended family units. In customary fashion, particular materials used in construction of the dam are associated with a particular gender. For example, a *kahi* tree is used as a feminine water conduit and a lontar palm is used as a masculine water conduit. The patterns and sequences of exchanges in marriage and in dam construction are similar. The wife-taking patriclan obtains the *kahi* tree from a forest owned by the wife-giving patriclan in a set of exchanges that parallel the gifts (gold, buffalo, horses) and counter-gifts (pigs, cloth) traded in marriage.

The analogy between the exchange of women and exchange of trees is further extended in corresponding avoidance taboos. In the dam-building trope, a male member of the wife-taking patriclan must avoid the forest from where his kin group harvested the feminine tree. If he must walk through the forest, then he should cover his face to avoid looking at any feminine element in his brother-in-law's territory. Analogously, a groom is forbidden to look at his brother-in-law's wife or receive anything from her with his hands.

#### *Exchanging women and cutting timber*

In Kodi, similar to Mangili, there is a conceptual concordance between the exchange of women and the exchange of trees. In 1978 a group of men from the West Sumbanese district of Weyewa harvested timber from a forest that is an important part of the natural and cultural heritage of Kambapa. Kambapa is an area in Kodi neighbouring Karendi and the people of Kambapa are genealogically related to Karendi people. The Weyewa men obtained permission to harvest the timber from local Kambapa leadership according to customary protocol. To do this, the Weyewa men approached Bapa Wodili, who is both a traditional Marapu leader and a local administrator in the national government, expressing their desire to cut the trees in Kambapa and take them back to their own village to use in building their houses. This initial formal request to harvest timber in Kambapa is analogous to the first meeting that begins the Kodi marriage exchange processes. In marriage exchanges, the wife-takers always go to the house of the wife-givers to voice their interest in obtaining one of their women for marriage. This analogy was artic-

ulated by Bapa Wodili who said that the timber cutters and the Kambapa residents reached an agreement in a manner that was "the same as if [the Weyewa men] took a daughter of Kambapa to marry."

After the contract was settled the participants sacrificed a chicken and used the intestines for divination. The divination revealed that Kambapa was indeed the proper source of timber for the Weyewa homes. In exchange for the trees, the Weyewa men presented a counter-payment of one pig, two pieces of men's cloth, and two women's sarongs. These are the same goods that are typically presented by the wife-givers as counter-gifts to the wife-takers in a Kodi marriage. At the final ceremony of the timber harvest, a group of men from Kambapa travelled to Weyewa where the timber-takers sacrificed a large buffalo and distributed betel vine leaves and areca nuts. Bapa Wodili claims that all members of the local community agreed to this trade. But now, twenty years later, Kambapa residents complain that there are no longer any large trees in Kambapa because the Weyewa men cut them all down. In hindsight, the people of Kambapa correlate forest felling with undesirable ecological consequences.

*The disjunction of customary environmental regulations and national laws*

The Indonesian national government's style of environmental management is very different from the indigenous one. According to a Village Head (*Kepala Desa*) in Kodi, "Indigenous forestry laws were much stronger than modern state forestry laws before Sumba was incorporated into the nation of Indonesia." The system of indigenous forestry requires that anyone violating established rules must sponsor a sacrificial ritual during the dry season. The violator and/or his family may become sick and die for failing to pay the ritual fine. Cutting an unusually large tree might incite the ancestors "to cast the offender into exile in Ende [a town on the neighboring island of Flores]" according to the Village Head, "[But] enforcement of customary environmental codes are not as strong as they were in the past." The relaxation of customary law is due in part to the introduction of the governmental forestry plans and because of the partial conversion of many Kodi people to Protestantism and Catholicism.

Violation of national forestry laws is punishable by monetary fines or imprisonment. At least eight people in Karendi have been imprisoned for the illegal activity of cultivating a garden on national forest lands. Two men were incarcerated for six months because they cut down trees in the public forests. Another man, who is a *Rato Marapu* and the customary leader of his descent group, served ten months in jail for cultivating a garden on expropriated land even though he had rights to the land according to the customary law (*adat*). An additional eight Karendi men are in jail for killing men from the neighbouring district of Rara during a battle at Mata Loko River in 1996. The cause of the battle was a dispute over ownership rights in Mata Loko Forest that forms the border between Karendi and Rara. Illegal activities probably occur more frequently than these numbers suggest, but are not penalised; for one reason, because there are not enough law enforcement personnel to monitor the activities of all of the people living in and near the forests.

*Conflict in the development of a sacred place*

A dispute over a plan to construct a water pipe in Mata Loko was the subject of intense debate within the Karendi community. The major rift in the community was between people who had converted to Protestantism and adherents of Marapu. In the 1980s the Indonesian Department of Drinking Water and the Ministry of Forestry announced a plan to construct a water pipeline to carry fresh water from the wetter interior forests of Karendi down to the dryer coastal plains of Kodi, where fresh water is a critical resource in short supply. These government agencies outsourced the project to a corporation based on Java.

Marapu followers opposed the pipeline because they feared that the desecration of Mata Loko would provoke the ancestors, inviting widespread disease and death. Local Protestants supported pipeline construction because they say that they no longer fear the wrath of the Marapu forest spirits. The Protestants accepted a cash payment and signed a contract authorising construction of the pipeline without obtaining consent from the Marapu followers. The pipeline would be constructed with or without the consent of Marapu followers.

Karendi people negotiated a deal that required the outside agencies to sponsor a sacrificial feast prior to pipeline construction in accordance with customary law. In a syncretic rendition of a traditional ritual, the Javanese corporate executives and Sumbanese government officials brought water buffalo and pigs along with other ritual supplies such as rice, betel vine leaves, areca nuts, sugar, and coffee to Karendi. A Protestant minister led a prayer ceremony and directed the killing and the distribution of sacrificial meat. The prize portions of the sacrificial animals, including the horns of the water buffalo and the jaws of the pigs were offered to the ancestors. In the offering, these prize portions were placed upon the Rat Stone altar in Mata Loko Cave. Following the sacrificial rituals an above-ground metal pipe was constructed. The pipe is a prominent marker on the main path along the river bank to Mata Loko Cave. It is a visible reminder of the ongoing tensions between Marapu and Christianity. The pipe boldly represents continuing problems caused by the disjunction of state forestry policies and indigenous land tenure.

This case of pipeline construction illustrates that development in sacred places requires extra considerations that do not apply to non-sacred places. This case also demonstrates that the management of sacred places is often a source of conflict. Contradictions between national strategies and local principles are common in the inhabited forests of Indonesia and are often sources of conflict (Wadley et al. 1997). It is common for problems to arise from the disjunction between customary and national regulations (Peluso 1990). One potential problem resulting from the disjunction is that nullifying traditional land tenure laws removes the ability of local people to control exploitation or potential over-exploitation (Colchester 1993) of forest products by people from other parts of Sumba and from other islands.

*Experimenting with ancestral power in sacred places*

In Kodi, a debate over the power of the ancestors to enforce the laws governing sacred places is part of an ongoing struggle to reconcile Marapu and Christianity. The processes of religious change in Kodi include experimentation with Marapu and Christian rules

and principles. One day Muda Duni, who lives in a hamlet on the border of Mata Loko Forest, tested a hypothesis that it is no longer taboo to gather culms from the sacred patch of bamboo at the entrance to Mata Loko Cave. In Marapu, violation of this taboo causes the sky to darken and a tremendous storm to appear. In his experiment, Muda Duni gathered several culms that had broken and fallen onto the bank of Mata Loko River. He wanted to carry all of these culms home to use for construction materials, but the men with whom he was travelling refused to help him carry the load from fear that the ancestors would see them, become angry, and deliver a punishment. So Muda Duni hauled the bamboo home by himself in two loads.

As he was carrying the second load of bamboo back to his hamlet, a storm cloud appeared over the forest and a few large raindrops "the size of a man's thumb" thumped the tops of his ears. The ominous raindrops represented three things for Muda Duni. First, they confirmed the continuing presence of supernatural spirits in Mata Loko. Second, they proved that the ancestors are still protecting their sacred resources and still have the ability to punish people for desecrating them. Third the incident attested to the weakening power of Marapu spirits because there were only a few drops of rain instead of the devastating floods that are promised to occur for violating such a weighty taboo.

Muda Duni's father is Doka Tora, the *Rato Marapu* introduced above in the discussion of rain shaking rituals. Doka Tora is not only the leading ritual officiant for ceremonies associated with Mata Loko, he also "owns" sacred histories about Mata Loko. Like Muda Duni, Doka Tora is conducting comparative experiments with Marapu and Protestantism. During an excursion that Doka Tora led through the Mata Loko Forest into the Mata Loko Cave, he tested the same regulation that protects the sacred patch of bamboo from harvests. Doka Tora convinced a few of the younger people who accompanied him to retrieve bamboo that had naturally fallen from that same sacred patch of bamboo into Mata Loko River. He wanted to use the bamboo cylinders as storage containers for seeds from his rice harvest. As the group was climbing out of the river valley to the bluffs above Mata Loko, several rain clouds appeared, darkening the sky. One member of the party said, "You see! Just as we are leaving Mata Loko [with the bamboo] a huge storm is about to fall!" Doka Tora smiled, his companions giggled, and they continued along their path.



*Developing faiths*

These experiments with sacred bamboo in Mata Loko parallel the religious predicament that Muda Duni and Doka Tora are facing. They are members of the Marapu priesthood, but they are being pressured to convert to another religion by the social, cultural, political, and economic circumstances of the times. These men have accepted some portion of the Protestant teachings, but they still believe (to differing degrees, however) that their ancestors are present in the natural world and that it is their duty to communicate with the spirits on behalf of the Karendi community. This father and son are experimenting with the tenets of Marapu and Protestantism as they struggle to define their own faith. The way that these two men and other residents of Karendi redefine Marapu environmental codes will impact the way that the community manages, not only sacred bamboo, but also their overall understanding and management of natural resources. These anecdotes about religious experimentation in Kodi imply that the conversion from Marapu to Christianity has consequences for the conservation of sacred plant species and sacred places.

There are in fact many consequences of the reorientation of the gaze of prayer from the ancestors and forests to God and Christian churches. In the cases of both Protestantism and Catholicism, natural monuments such as trees and rocks that are the altars and temples of the Marapu religion are replaced by the built sanctuaries of the Christian church. The consequences of religious conversion are apparent in agricultural rituals. In Marapu garden rites, many prayers are addressed to the dualistic deity 'Mother-Who-Owns-the-Land, Father-Who-Owns-the-Rivers' (*Inya Manga Tana, Bapa Manga Loko*). Under the influence of Catholicism, for instance, the deity is split into two separate entities and its local identity is transformed into a foreign identity. 'Mother-Who-Owns-the-Land' is transformed into the 'Virgin Mary' and 'Father-Who-Owns-the-Rivers' is transformed into 'Jesus Christ.' Catholicism changes local sacred figures and severs sacred places from the local setting. In Karendi, most people who convert to Christianity become Protestants. There are also several households who have converted to Jehovah's Witness. In the district of Kodi as a whole, most local people join either the Protestant or Catholic faith. Islam and Hinduism are represented in Kodi by police, military, and government officials who have moved from Java, Bali, and other Indonesian islands.

*The influence of history and reciprocity on the conservation of sacred resources*

The sacred value of Mata Loko is an example of the assimilation of nature into the social exchange networks that permeate Kodi society. In the context of social relationships, ritualised reciprocity expresses the value of exchange goods. Items with the highest symbolic value—women, rice, souls—are the focus of formal reciprocal exchanges. In Mata Loko, Marapu elders and the ancestors bargain over sacred goods such as sacred trees, water, and bamboo and sacred services such as rain-making. Ritual leaders present payments of sacrifices and prayers and the deities render counter-payments of ecological products and services. The goods and services such as bamboo from Mata Loko that require ritual prepayment are also the components of the environment that are sacred.

In Karendi the historically significant ecological goods and services that are most valued are highlighted in their natural contexts and symbolically re-cast as sacred goods. At the moment of re-conceptualisation natural resources acquire a new set of constraints regulating their use. Many species of bamboo, one of the examples mentioned above, are typically cultivated and heavily exploited for use in house construction, as rainwater conduits, tools and storage containers (to name just a few of their uses). But harvesting from the cluster of sacred bamboo in Mata Loko Forest is deterred by threats of events that are destructive to human and environmental health. Upon sanctification, bamboo and other natural products assume a new role in the local cosmology.

Whereas multi-generational time is the basis for the value of ceremonial exchange items, it also lends value to natural resources. Sacred resources become symbols of mutual aide “that can be held onto forever” (Keane 1997: 69). These religiously significant objects “play an important role in constructing the continuity of social identities” (Keane 1997: 215). In the Sumbanese economy, the exchange of sacred resources allows people to transcend the ephemeral world and join the enduring community of ancestors “concretized in tombs and villages, recalled in names and histories” (Keane 1997: 69). Reciprocal exchange of sacred and non-sacred goods occurs among networks of living Sumbanese people as well as between currently-living Sumbanese and their ancestors. Through the exchange of sacred goods, the people of Karendi engage in relationships with the ancestors. Exchange goods connect people to an ancestral realm and

to symbols of their history. Their long term maintenance is critical because they are effective links to a desirable state of affairs.

The residents of Karendi are similar to farmers living in forested areas in other parts of the world who actively manage their gardens and their forests (Posey 1985). They use a variety of techniques and strategies to meet their subsistence needs and to fulfil their social obligations. In the case of their sacred forests Karendi people seem not only to be planning for future generations as some other communities do (Wadley et al. 1997), but honouring preceding generations as well. The maintenance of natural resources is encouraged by an exalted status that is constituted by exchange alliances and local history. Hoskins (1993: 67) captures the importance of time for creating value in Kodi cosmologies in this statement:

It has often been said that a local view of the world is, primarily and most importantly, a view of time. The perception of how time passes is also a perception of life and what it has to offer.

This analysis of sacred resources reveals obvious parallels between ecological relationships and social relationships in Karendi. Sanctification of natural products occurs because people identify specific objects with the ancestors and therefore behave toward those objects as they would towards the "Dead People" themselves. Reciprocal exchange of plant and animal sacrifices for ecological goods and services characterises the management of sacred resources in animistic cosmologies (Descola 1996); Marapu is a good example of this principle.

#### *The contexts for conservation of sacred resources*

In this article, I have described the religious and social contexts for the management of sacred resources in Karendi. The ways that Marapu sometimes encourages resource conservation is especially apparent in the case of water—a particularly scarce and contested resource on Sumba. The karst topography of Sumba contains rivers and creeks that alternately surface above ground, recede underground, and resurface further downstream. Rivers and springs are the main water supply for 75.49% of the Sumbanese population (Monk et al. 1997) and for 100% of residents in rural areas. Water has great impact on the physical and cultural organisation of communities on Sumba.

There has been no attempt in this chapter to quantitatively prove that sacred forests are sites of biodiversity conservation. Rather, this chapter has shown that a particular set of values apply to natural resources that are sacred, or sacred resources. The data demonstrate that respect and reciprocity are central values governing ritualised relations among people, between people and supernatural spirits, and between people and natural resources. The data imply that Kodi ethical codes might be part of a conservationist ethic with regard to sacred natural resources but do not prove, through quantitative analyses, that sacred resources are actually conserved to a greater degree than non-sacred ones. Nonetheless, in the case of Mata Loko qualitative evidence suggests that the notion of sacred is linked to conservationist management techniques. The Karendi values associated with sacred forests form a conservationist ethic, whether or not they translate into the actual behaviour that is necessary for biodiversity conservation. Clearly, the notion of sacred has consequences for the ways that communities relate to and interact with environments.

This article illustrates three ways that religious beliefs have the potential to lead to behaviours that affect the environment: 1) Resource use is restricted by the belief that the ancestors are guardians of the forest and enforced by supernatural sanctions; 2) The ritual management of scarce resources such as water and culturally/historically valuable resources such as bamboo is a form of conservation planning; 3) Experimenting with the indigenous religion is simultaneously experimenting with traditional resource management.

This article contributes to broader anthropological and geographical contexts. The information that is presented here corresponds to environmental anthropology projects in other parts of Southeast Asia with information from a remote part of the Indonesian archipelago. This is one of the first research projects focusing specifically on the cultural ecology of Karendi, Kodi, and indeed Sumba. The cultural ecology of Sumba can enhance our understandings of religion and ecology in the region. This ethnographic case of a society where traditional religion persists sheds light on questions of how local belief systems are part of environmental adaptations and how the interactions between indigenous and world religions impact local cultural ecologies.

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## NOTE

1. This statement is based upon information from the local community and personal observation. There are no reliable rainfall statistics available specifically for the district of Kodi.

## REFERENCES

- Colchester, M. 1993. "Colonizing the rainforests: the agents and causes of deforestation", in M. Colchester and L. Lohmann (eds) *The Struggle for Land and the Fate of the Forests*. Penang, Malaysia. World Rainforest Movement, pp. 1-15.
- Descola, Philippe 1996. "Constructing natures: symbolic ecology and social practice", in Philippe Descola and Gisli Palsson (eds) *Nature and Society: Anthropological Perspectives*. London. Routledge, pp. 82-102.
- Hoskins, Janet 1984. *Spirit Worship and Feasting in Kodi, West Sumba: Paths to Riches and Renown* Ph.D. dissertation. Cambridge. Harvard University Press.
- Hoskins, Janet 1988. "The drum is the shaman, the spear guides his voice". *Social Science and Medicine* 27(8): 819-28.
- Hoskins, Janet 1993. *The Play of Time: Kodi Perspectives on Calendars, History, and Exchange*. Berkeley. University of California Press.
- Keane, Webb 1997. *Signs of Recognition: Powers and Hazards of Recognition in an Indonesian Society*. Berkeley. University of California Press.
- Monk, Kathryn A., Yance de Fretes, and Gayatri Reksodiharjo-Lilley 1997. *The Ecology of Nusa Tenggara and Maluku*. Singapore. Periplus Editions.
- Onvlee, Louis 1977. "The construction of the Mangili dam: notes on the social organization of Eastern Sumba", in P.E. Josselin de Jong (ed) *Structural Anthropology in the Netherlands*. The Hague. Martinus Nijhoff, pp. 151-63.
- Peluso, Nancy 1990. "A history of state forest management in Java", in M. Poffenberger (ed) *Keepers of the Forest: Land Management in Southeast Asia*. West Hartford, CT. Kumarian Press, pp. 27-55.
- Posey, Darrell 1985. "Indigenous management of tropical forest ecosystems: the case of the Kayapo Indians of the Brazilian Amazon". *Agroforestry Systems* 3: 139-58.
- Wadley, R.L., C.J. Pierce Colfer, and I.G. Hood 1997. "Hunting primates and managing forests: the case of Iban forest farmers in Indonesian Borneo". *Human Ecology* 25(2): 243-71.